

## Claims

What is claimed:

1. A photon detector module comprised of:
  - a photon detector array for producing a detector array output signal in response to a photon input,
  - 5 a multilayer processing module for the receiving of and in electrical connection with said detector array output signal,
    - said processing module comprised of at least two stacked layers wherein each of said at least two stacked layers is comprised of at least one integrated circuit chip for the processing of said received detector array output signal,
    - 10 each of said at least one integrated circuit chips comprising,
      - amplifier circuitry for the amplification of said detector array output signal,
      - differentiator circuitry in electrical connection with said amplifier circuitry for the differentiation of said detector array output signal,
      - comparator circuitry in electrical connection with said differentiator circuitry for comparing said
      - 15 detector array output signal to a predetermined threshold,
      - analog to digital converting circuitry in electrical connection with said comparator circuitry for converting said detector array output signal to a digitized value,
      - a FIFO register in electrical connection with said analog to digital converting circuitry for the receiving of said digitized value, and,
      - 20 output means in electrical connection with said FIFO register for the outputting of said FIFO register data for further processing.
  - 2. The photon detector module of Claim 1 wherein said output means comprises at least one multiplexing circuit.

3. The photon detector module of Claim 1 including at least one T-connect for the electrical connection of said detector array.
- 5 4. The photon detector module of Claim 1 wherein said digitized value is a one bit digital value.
5. The photon detector module of Claim 1 wherein said predetermined threshold is programmable using external programming means.
- 10 6. The photon detector module of Claim 1 wherein said detector array is comprised of at least an 8x128 array of detector pixels.
7. The photon detector module of Claim 1 wherein said detector array is comprised of at least a 128x128 array of detector pixels.
- 15 8. The photon detector module of Claim 1 wherein said detector array is an InGaAs detector array.